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(54) **CUSTOMIZED INTERFACE BASED ON VIEWED PROGRAMMING**

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(52) **U.S. Cl.** **725/46; 715/745; 715/811**

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See application file for complete search history.

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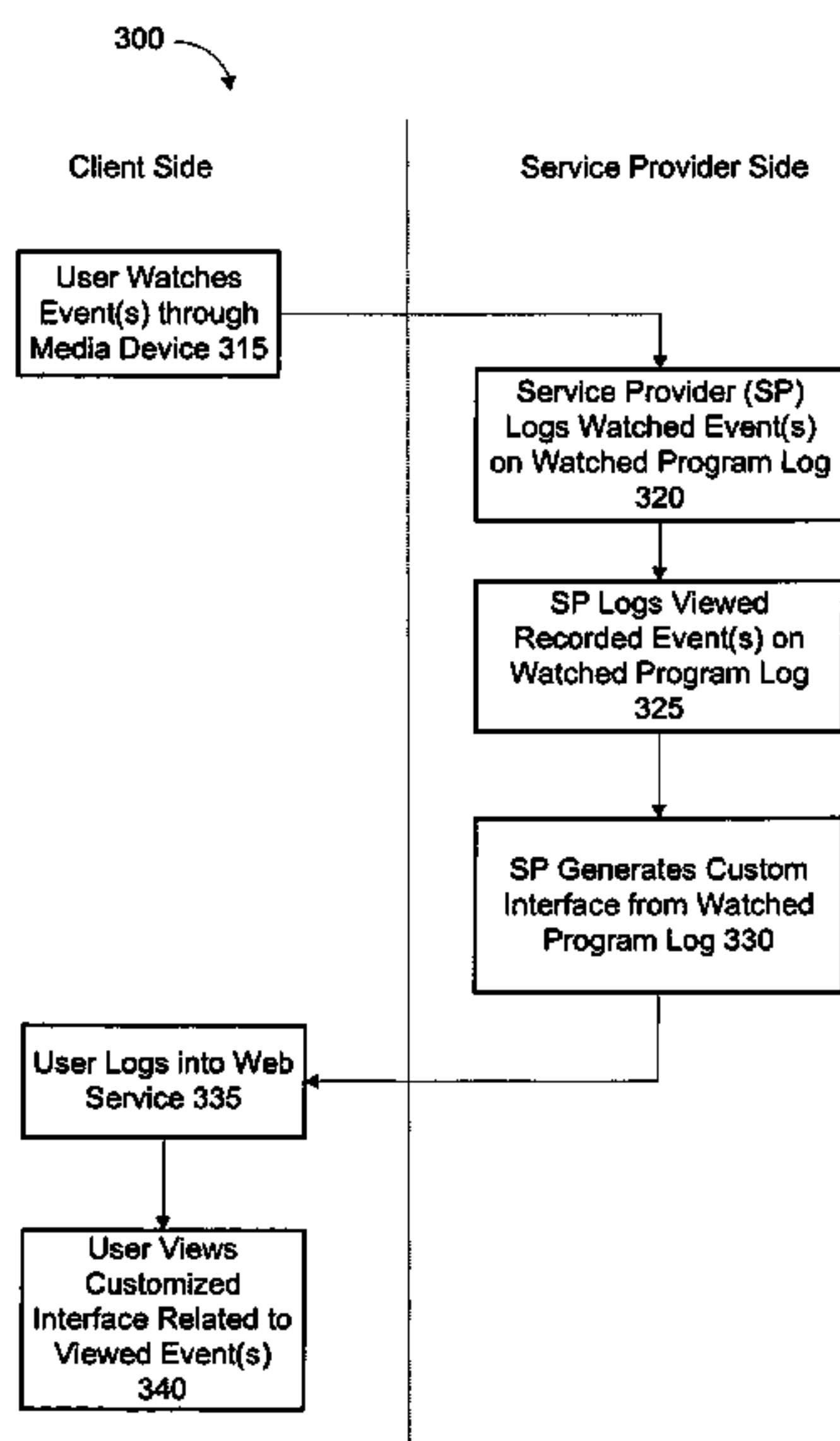
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Pablo Meles

(57) **ABSTRACT**

In one embodiment, a system generates a customized interface based on viewed programming. The system stores a program that a user viewed through a media device; searches through a network for information related to the viewed program; and extracts data associated with the information related to the viewed program. A custom interface is generated based substantially on the data associated with the information related to the viewed program.

29 Claims, 5 Drawing Sheets



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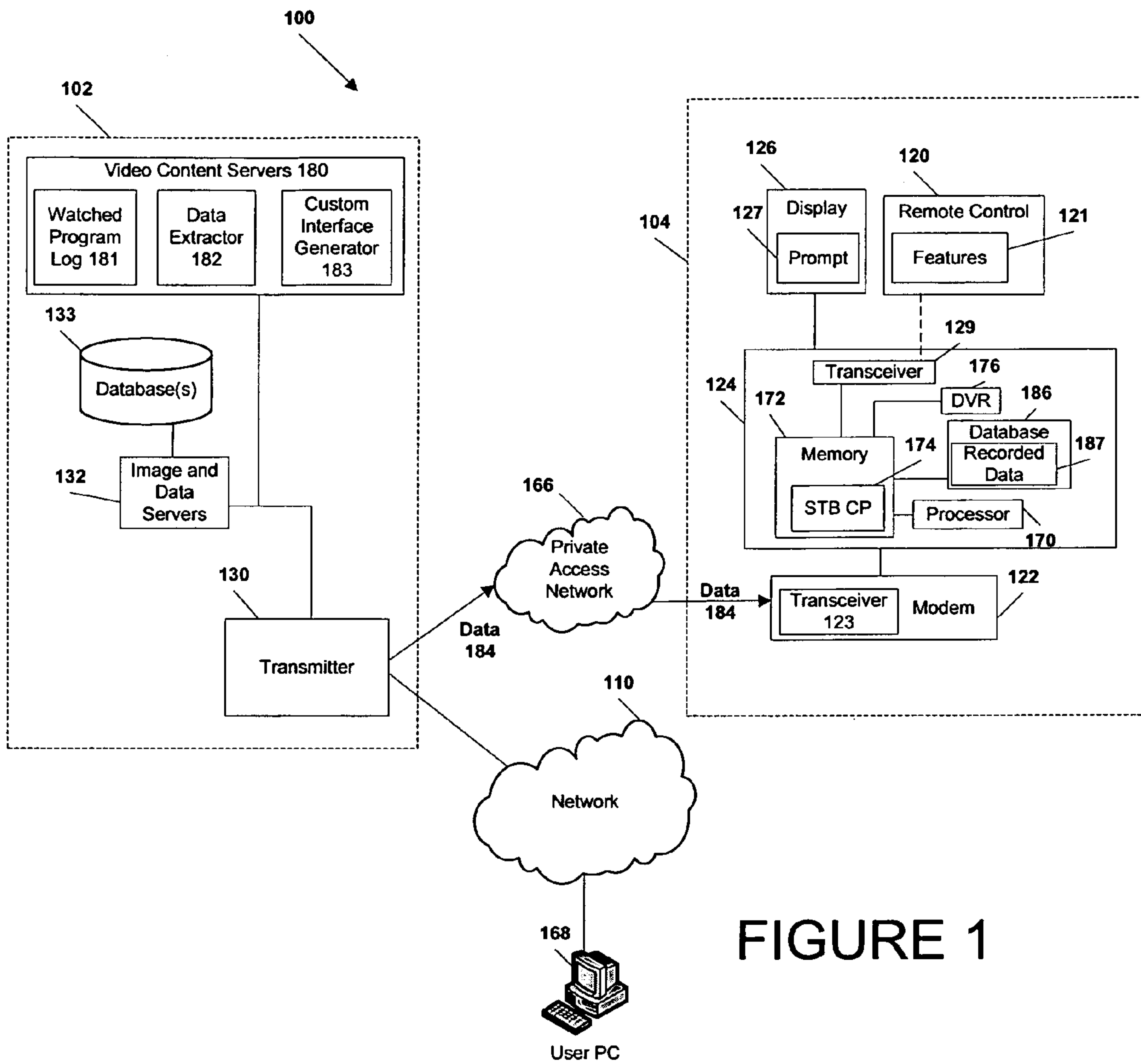


FIGURE 1

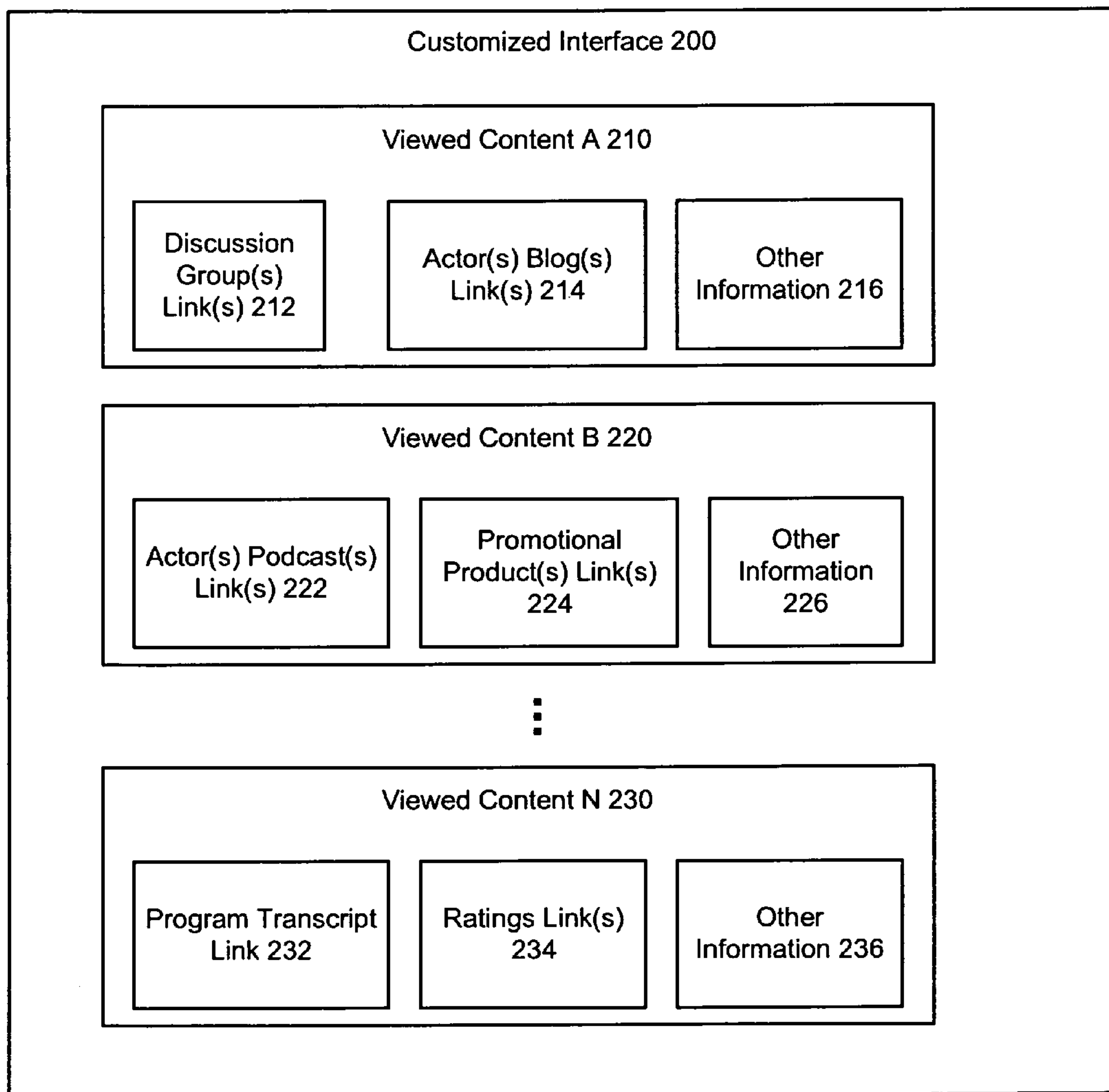


FIGURE 2

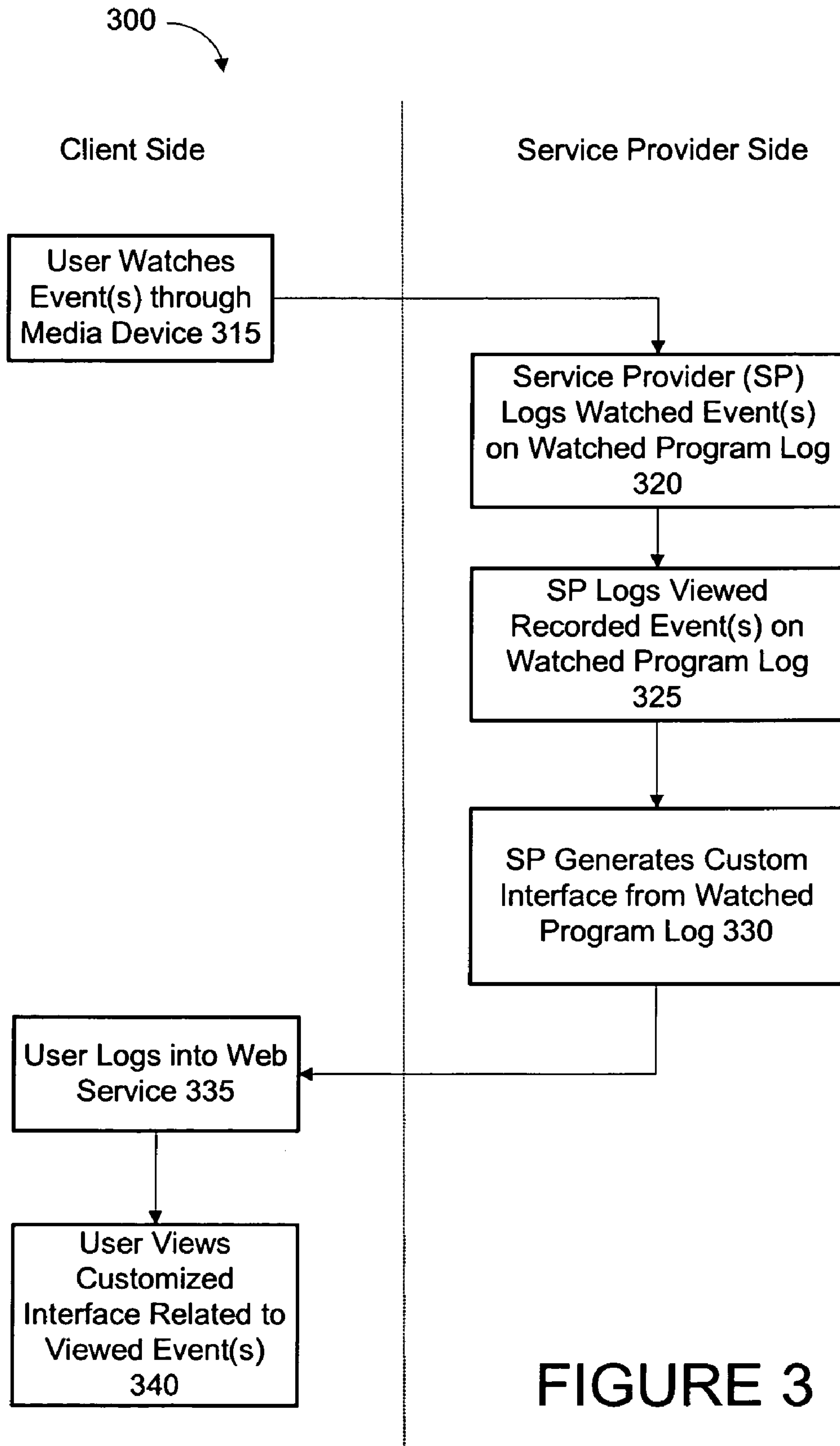


FIGURE 3

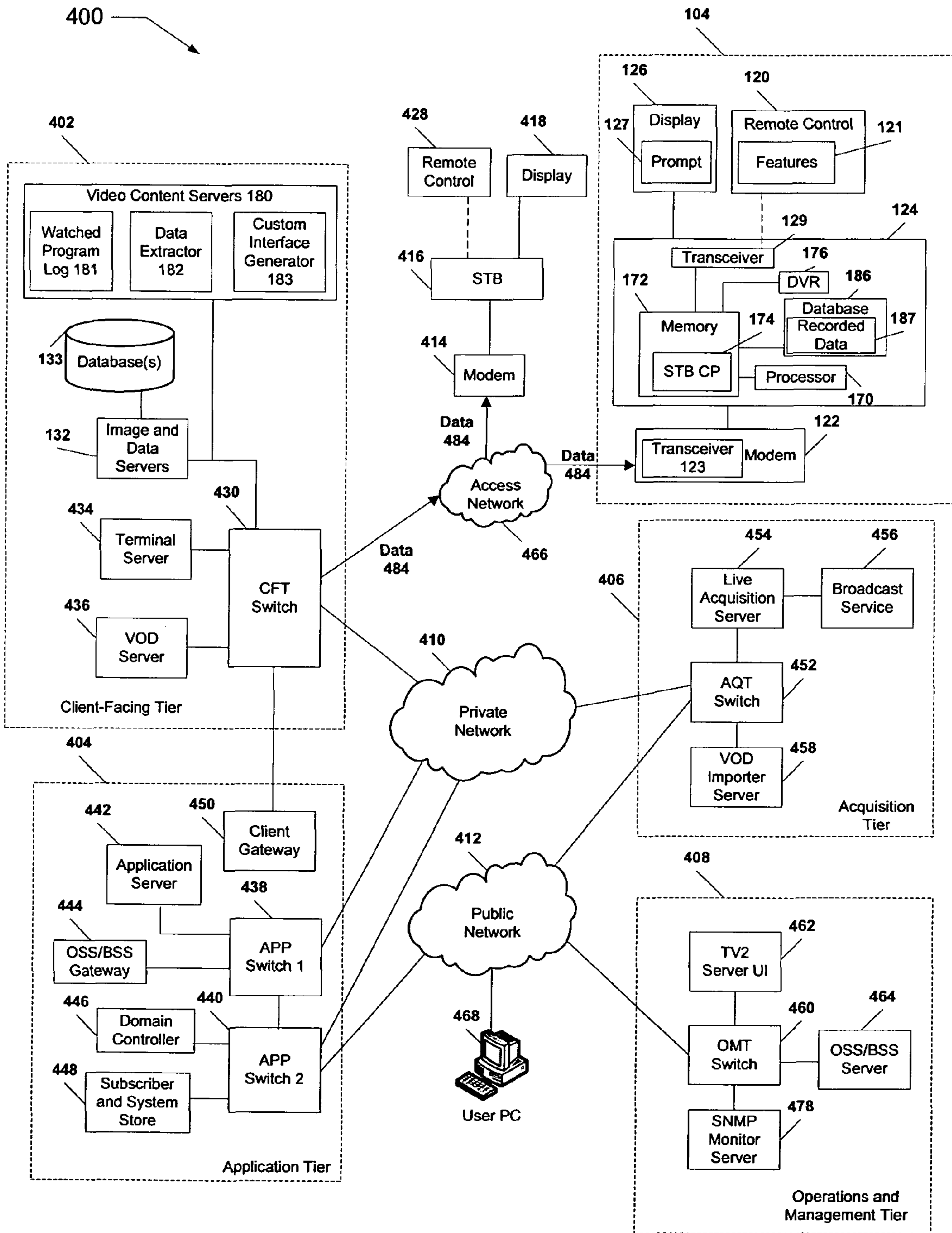


FIGURE 4

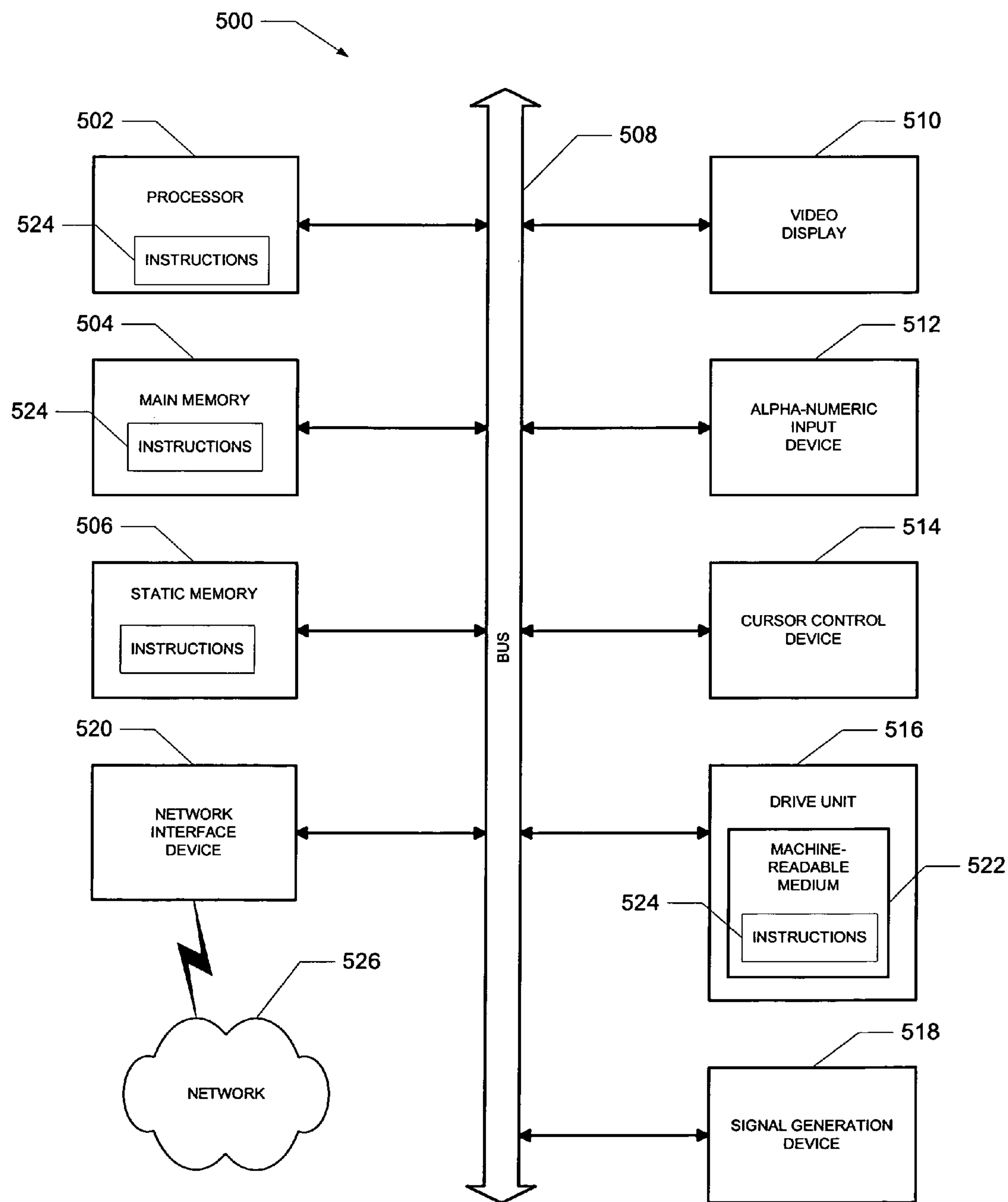


FIGURE 5

1**CUSTOMIZED INTERFACE BASED ON
VIEWED PROGRAMMING**

FIELD

The application relates generally to the field of multimedia processing, and more specifically to a customized interface based on viewed programming.

BACKGROUND

While watching broadcast programming, a segment of particular interest to a user may be presented. For example, the broadcast programming may include a recipe or may refer the user to a website. The user then searches a network, such as the Internet, for that cooking recipe or website. In some instances, when the user accesses the Internet, the cooking recipe or item of interest is not immediately available. The user often, then, searches through the website for the item of interest. Sometimes, the reference to the particular show is not found due to the large amount of information on the website or the inadequate search mechanisms.

In some instances, immediate access to the Internet is not available for the user. The user may then forget the website address given, or may forget the segment altogether in the course of a busy day.

BRIEF DESCRIPTION OF DRAWINGS

An example embodiment of the present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

FIG. 1 illustrates a system environment in which one embodiment may be implemented.

FIG. 2 illustrates a customized interface according to an example embodiment.

FIG. 3 illustrates an interactive flow chart that demonstrates a method taking place on both the client side and the service provider side, according to an embodiment.

FIG. 4 illustrates an Internet Protocol Television (IPTV) system environment in which an example embodiment may be implemented.

FIG. 5 shows a diagrammatic representation of machine in the example form of a computer system within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed.

DETAILED DESCRIPTION

According to an aspect of the present subject matter, a system is provided to generate a customized interface based on viewed programming. The system stores a program that a user viewed through a media device; searches through a network for information related to the viewed program; and extracts data associated with the information related to the viewed program. A custom interface is generated based substantially on the data associated with the information related to the viewed program.

In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the disclosed embodiments. It will be apparent, however, to one skilled in the art that the disclosed embodiments may be practiced without some of

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these specific details. In other instances, well-known structures and devices are shown in block diagram form.

EXAMPLE SYSTEM ENVIRONMENT

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Referring to FIG. 1, an illustrative embodiment of a system that may be used to provide video content is illustrated and is generally designated **100**. As shown, the system **100** may include a service provider tier **102** and a media device tier **104**. Tier **102**, **104** is coupled to network **110**, such as the Internet; and to a private access network **166** for communication. The private access network **166** may be, for example, a managed video content services access network or may be an Internet Protocol Television (IPTV) access network, as shown in more detail in FIG. 4.

In an illustrative embodiment, modems, such as a modem **122** may be coupled to the private access network **166**. The service provider tier **102** may communicate with a representative media device **124** via the modem **122**, for instance. The modem **122** may include a transceiver, such as transceiver **123** of modem **122**, to receive and send data **184**, for instance. The data **184** received may include video content and/or locator code data.

The locator code data may include, for instance, a start time of a program, an end time of a program, a channel or access point of a program, a code associated with the program (e.g., VCR+® code), and any other information that may be useful in recording a program or in determining access to a recorded program.

The transceiver **123** may receive the video content from a video content server **180** (or a service provider) on a first band channel, and may receive locator code data from the service provider on a second band channel that is lower than the first band channel. Embodiments herein may work with different band channel systems that combine higher quality band channels with narrower band channels, such as AT&T's HomeZone® (combining Satellite with DSL) and other embodiments that combine Satellite with WiMax, for example.

The video content may be sent on a high quality band channel, such as from a satellite source, cable source, IPTV source, on-air source, streaming media from the Internet or media downloaded from the Internet, as in a Podcast®, or any other suitable source. The locator code data may be sent via phone, DSL, WiMax, cable source, wireless source, IPTV source, satellite source, on-air source, or any other suitable source. The locator code data and/or the video content may be sent with an electronic program guide (EPG). In the instance of different band channels, the locator code data may be transmitted to the user separately from the video content.

In other embodiments, the video content and the locator code data are sent to the media device tier on the same band channel, either together or separately, as appropriate. The locator code data may be embedded in, and transmitted with, the video (e.g., in one of the lines in the vertical blanking interval for analog TV, or in the MPEG user data for digital TV). In another embodiment, the locator code data may not be sent to the media device. In this instance, the service provider may log the data in the network, rather than logging the data at the media device.

A lower bandwidth bi-directional communications link may send and/or receive data. For example, through the transceiver **123**, the media device **124** may transmit information to a video content server **180** about what program the user is or has viewed to use, for example, in a customized interface, as discussed herein. The information concerning viewed programming may be sent through either a lower or higher bandwidth communications link.

Additionally or alternatively to the content servers **180**, data **184** may be generated, associated, and provided by an outside database, the device **124**, and/or a user of the device **124**, in other embodiments not shown.

The service provider tier **102** may communicate with a large number of set-top boxes, such as the representative set-top box **124**, over a wide geographic area, such as a regional area, a metropolitan area, a viewing area, a designated market area or any other suitable geographic area, market area, or subscriber or customer group that may be supported by networking the service provider tier **102** to numerous set-top box devices. In an illustrative embodiment, the client-facing tier, or any portion thereof, may be included at a video head-end office.

The media device **124** may include a cable box, a set-top box, a transmitter, a multifunctional device, a digital video recorder, a television, a mobile device (such as a mobile phone), a video cassette recorder, a personal computer, a multifunctional device, an image recorder (e.g., for pictures), an audio recorder (e.g., for satellite radio), or any other media device. The media device may include a user interface for IPTV on a display **126** (such as a television monitor) associated with the media device **124**, for instance.

In a particular embodiment, the service provider tier **102** may be coupled to modem **122** via fiber optic cables. Alternatively, the modem **122** may be digital subscriber line (DSL) modems that are coupled to one or more network nodes via twisted pairs, and the service provider tier **102** may be coupled to the network nodes via fiber-optic cables. Each set-top box device **124** may process data received via the private access network **166**, via an IPTV software platform, such as Microsoft® TV IPTV Edition, as discussed in more detail with regard to FIG. 4.

The set-top boxes **116**, **124** may transmit the data **184** to an external display device, such as the display device **126** for displaying content, such as a broadcast program or event, for instance.

The second set-top box device may communicate with the remote control **120**. The device **124** may include a wireless transceiver (e.g., transmitter and/or receiver) **129** to communicate with a wireless transmitter/receiver (not shown) of the remote controls **120**.

The remote control **120** may include multiple features or indicators **121** capable of being selected to connect and interact with the device **124**. The selections with regard to the segment list may be made using features of one of the remote controls **120**, as described in more detail herein. The set-top box devices **124** may communicate commands (i.e., to view a particular broadcast program) received from the remote control devices **120** to the service provider tier **102** via the private access network **166**.

Further, the set-top box device **124** may include a STB processor, such as STB processor **170**, and a STB memory device, such as STB memory **172**, which is accessible to the STB processor **170**. In one embodiment, a computer program, such as the STB computer program (STB CP) **174**, may be embedded within the STB memory device **172**.

The memory **172** of the device **124** may be coupled with a database **186** including recorded data **187**, e.g., video content locally recorded from a transmission by a service provider. Each set-top box device **124** may also include a video content storage module, such as a digital video recorder (DVR) **176**. The device may include the DVR, as shown in FIG. 1. In another embodiment, the DVR may be a network DVR.

The device **124** further includes logic (e.g., STB CP **174**) to process the locator code data, to record selected content, and to monitor content being viewed for a minimum amount of

time. The viewed content may or may not be previously recorded by the DVR **176** of the media device **124**.

The service provider tier **102** may also include one or more video content servers **180** that transmit video content requested by viewers via their set-top boxes. In an illustrative embodiment, the video content servers **180** may include one or more multicast servers. The video content servers **180** may additionally or alternatively transmit audio content, and/or image content.

A list of programs that a user has viewed through the media device, as determined by the logic **174**, may be stored on a watched program log **181** of the video content servers **180**. The means for storing a list of programs that a user viewed through the media device includes the watched program log **181**. The data may be stored in volatile or non-volatile memory.

A network, such as the Internet, may be searched for information related to each viewed program of the list of programs by a data extractor **182** of the video content servers. The related information may include a recipe, a program discussion group, a program web log, a program transcript, a program rating system, an actor Podcast®, program summary information, video thumbnails, or any other program related information. The network may include the Internet, and/or a home or enterprise network with information related to programming, for example, a Google® local hard drive search.

Further, data associated with the information related to each viewed program may be extracted from the Internet by the data extractor **182**. The data may include a web link to any program-related information, the recipe, a link to the recipe, the program discussion group or a link to the discussion group, the program web log or a link to the web log, the program transcript or a link to the transcript, the program rating system or a link to the rating system, a promotional product link (Web advertisements may match those on viewed programs), an actor Podcast® link, program summary information or a link to the information, video thumbnails or a link to the thumbnails (e.g., to watch favorite segments again), or any other program related information or a link thereto.

The data associated with the information related to each viewed program (e.g., web links, recipes, transcripts, and other program specific information) may be extracted automatically by the data extractor **182** and stored on a database **133** of the video content server(s) **180**. The data may be stored in volatile or non-volatile memory. In an additional embodiment, the data may be extracted at the media device, wherein the media device includes a data extractor similar to the data extractor **182**. The means for searching through the Internet for information related to each viewed program of the list of programs includes the data extractor **182**. The means for extracting data associated with the information related to each viewed program includes the data extractor **182**. The means for storing the data associated with the information related to each viewed program includes database **133**.

A custom interface generator **183** may generate an interface **200**, of FIG. 2, customized for the user based substantially on the data associated with the information related to each viewed program. In particular embodiments, the interface **200** may be viewed on the user PC **168** or on a mobile device. In another embodiment, the interface **200** may be customized for viewing through the media device on the display **126**, for example within an IPTV viewing system. The custom interface generator **183** may generate a prompt **127** of the display **126**, such as a toolbar, a sidebar or a menu page to access the customized information related to previously viewed content. The means for generating a interface

customized for the user based substantially on the data associated with the information related to each viewed program includes the custom interface generate **183**.

In particular embodiments, the customized interface **200** does not include information for a program that has been recorded by the user but has not been viewed by the user. In an embodiment, only information from viewed programs is on the customized interface **200**.

In embodiments, the interface **200** exclusively includes broadcast programs viewed for a minimum predetermined duration or a minimum dwell duration. For example, the user has viewed each of these programs for at least 10 seconds. In another embodiment, the programs have been viewed for at least two minutes. The user may have the option to choose the minimum duration before the information is published to the interface **200**.

In the instance where there are multiple users for a single media device **124**, settings may be selected to account for such instances. In this instance, multiple interfaces associated with the media device **124** may be available based on pre-determined settings (e.g., each family member has a separate interface based on designated areas of interest), or based on program subject matter (e.g., children's programs, or day-time talk shows) or based on another method. There may also be a main customized interface for each media device **124**, with links to several other customized interfaces.

In an illustrative embodiment, the service provider tier **102** may include a transmitter **130** that manages communication between the service provider tier **102** and the private access network **166** and between the service provider tier **102** and the network **110**. The transmitter **130** may send the content and/or locator code data to the media device. The means for transmitting the locator code data to the media device may include the transmitter **130**.

As shown, the transmitter **130** is coupled to one or more image and data servers **132** for the database(s) **133**. Means for storing data includes the database of at least one of the service provider and the media device. In one embodiment, the database **133** stores the locator code data. The data may be stored in volatile or non-volatile memory. The database(s) **133** may also store broadcast events and related information. In an illustrative embodiment, the image and data servers **132** may be a cluster of servers, each of which may store still images, channel and program-related data, or any combination thereof. Again, the data may be stored in volatile or non-volatile memory.

EXAMPLE INTERFACE

FIG. 2 illustrates the customized interface **200** according to an example embodiment. The customized interface **200** may show a personalized or customized display of information related to locally viewed content. The interface **200** may be generated by the custom interface generator **183** of FIG. 1. The interface **200** is customized for the user (or users) of the media device based substantially on the data associated with the information related to each viewed program.

The customized interface **200** may include information related to a plurality of user-viewed programs. There may be references to a plurality of viewed content, e.g. Block A **210**, Block B **220** through Block N **230**. Each block **210**, **220**, **230** may refer to a viewed program and/or be associated with a viewed program through the associated media device. Block A **210** (or any another prominently featured Block, e.g., a highlighted or distinguished block) may refer to a most

recently viewed program, a most frequently viewed program or series, and/or a pre-determined program or program type, in particular embodiments.

As shown in FIG. 2, within each block **210**, **220**, **230** may be up to several references to information related to the associated programs. Data associated with this information may include weblinks, for example, discussion group(s) links **212**, actor(s) blog(s) links **214**, actor(s) podcast(s) links **222**, promotional product(s) link(s) **224**, program transcript link(s) **232**, ratings link(s) **234**, information about showing of future episodes, reruns, past episodes, links to programming events having the same actors, and other types of information related to the viewed program **216**, **226**, **236** (e.g., a cooking recipe, the program summary, a program blog, or links thereto).

The content for each block is substantially immediately available after the program is viewed or after the program is viewed for a minimum duration, so that the information becomes available in substantial real-time as the program is viewed.

The content may be viewed for a minimum amount of time before related information is added to the custom interface **200**. In this instance, there is no addition of information to the page **200** from every channel through which the user "surfs" during, for example, a commercial segment in the main program of interest. A minimum pre-determined duration or a minimum dwell duration may be implemented. For example, the user has viewed a program for at least 10 seconds before a related block is to be added to the interface **200**. The user may have the option to choose the minimum duration before the information is published to the interface **200**.

The customized interface **200** may be personalized to the user or users based on an attribute selected from a group including age, language, demographics, geographic region, and personal interface preferences. The interface **200** may be part of a personal home page with, for example, access to electronic mail, access to stocks, weather, news, local programming information, local events, calendar, and any other personal home page items.

The program, upon which the block **210** may be based, may be viewed after being recorded on the DVR. The program may be viewed while being recorded on the DVR, or may be viewed while not being recorded on the DVR.

In another embodiment, there may be a recommender system (not shown) within the service provider tier **102**. Based on comparison of the user's viewing habits with others, the recommender system may determine related programs and provide links **216**, **226**, **236** on the interface **200** to content related to those programs.

Flow Chart

FIG. 3 illustrates an interactive flow chart that demonstrates a method **300** taking place on both the client side and the service provider side, according to an embodiment. The steps described below may be performed under the control of a programmed processor, such as processor **502** and/or processor **170**, or the logic may be implemented and distributed among hardware, firmware, software, or a combination thereof within the digital video recorder **176**, for example.

At block **315**, a user watches one or more events through the media device **124**. The processor at the media device may process information when the program is viewed through the media device. The transmitter (e.g., the transceiver **123**) may then transmit the viewed program information to be used to extract data from the network.

At block **320**, on the service provider side, the service provider logs or stores the watched events of block **315** on the watched program log **181**.

At block 325, the service provider logs viewed events on the watched program log 325, wherein the events have been or are being recorded on the digital video recorder 176, for instance.

At block 330, the service provider generates the custom interface 200. The service provider includes the data extractor 182 to search through the Internet for information related to each viewed program of the list of programs on the watched program log 181. The data extractor 182 extracts data associated with the information related to each viewed program, as discussed above. The interface 200 customized for the user is generated based substantially on the data associated with the information related to each viewed program.

At block 335, the user logs into a Web service associated with the custom interface 200. Each user of a media device may have a different login and password, associated with their customized interface 200, as discussed in more detail above.

At block 340, the user views the customized interface 200 related to the viewed event(s). In an example embodiment, information or links may be delivered to a cell phone device, for example, as a multimedia message (MMS). As mentioned herein, the interface 200 may be viewed through a variety of means, including through the media device or through the computer 468.

In particular embodiments, users may more easily find information relevant to viewed programs because the content of the interface may be restricted to specifically viewed content.

The content of the interface may be provided as authored metadata along with the broadcasted programming events. The authored metadata may be provided either by the content producers, by the content deliverer, or by a third party, for instance. In an additional embodiment, interface content may be derived automatically from a search through the Internet or the network. The search may be based upon program title, content, places of things mentioned, or any other appropriate search term. In another embodiment, the interface content may be derived from both the authored metadata and a search.

EXAMPLE INTERNET PROTOCOL TELEVISION SYSTEM ENVIRONMENT

Referring to FIG. 4, an illustrative embodiment of an Internet Protocol Television (IPTV) system that may be used to provide video content is illustrated and is generally designated 400. As shown, the system 400 may include the media device tier 104, a client facing tier 402, an application tier 404, an acquisition tier 406, and an operations and management tier 408. Each tier 402, 404, 406, 408 is coupled to a private network 410; to a public network 412, such as the Internet; or to both the private network 410 and the public network 412. For example, the client-facing tier 402 may be coupled to the private network 410. Further, the application tier 404 may be coupled to the private network 410 and to the public network 412. The acquisition tier 406 may also be coupled to the private network 410 and to the public network 412. Additionally, the operations and management tier 408 may be coupled to the public network 412.

As illustrated in FIG. 4, the various tiers 402, 404, 406, 408 communicate with each other via the private network 410 and the public network 412. For instance, the client-facing tier 402 may communicate with the application tier 404 and the acquisition tier 406 via the private network 410. The application tier 404 may also communicate with the acquisition tier 406 via the private network 410. Further, the application tier 404 may communicate with the acquisition tier 406 and the

operations and management tier 408 via the public network 412. Moreover, the acquisition tier 406 may communicate with the operations and management tier 408 via the public network 412. In a particular embodiment, elements of the application tier 404, including, but not limited to, a client gateway 450, may communicate directly with the client-facing tier 402.

As illustrated in FIG. 4, the client-facing tier 402 may communicate with user equipment via a private access network 466, such as an Internet Protocol Television (IPTV) access network. In an illustrative embodiment, modems, such as a first modem 414 and the modem 122 may be coupled to the private access network 466. The client-facing tier 402 may communicate with a first representative media device 416 via the first modem 414. The client-facing tier 402 has similar characteristics to the service provider tier 102 of FIG. 1. Like reference numerals designate similar elements in the drawing figures.

In a particular embodiment, the client-facing tier 402 may be coupled to the modems 414, 122 via fiber optic cables. Alternatively, the modems 414 and 122 may be digital subscriber line (DSL) modems that are coupled to one or more network nodes via twisted pairs, and the client-facing tier 402 may be coupled to the network nodes via fiber-optic cables. Each set-top box device 416, 124 may process data received via the private access network 466, via an IPTV software platform, such as Microsoft® TV IPTV Edition. The media device 124, 416 may include a user interface for IPTV on a display 126, 418, for instance. The set-top boxes 416, 124 may transmit the data 484 to the external display device 418, 126 for displaying content, such as a broadcast program or event, for instance. The first set-top box device 416 may communicate with a remote control 428.

In an illustrative embodiment, the client-facing tier 402 may include a client-facing tier (CFT) switch 430 that manages communication between the client-facing tier 402 and the private access network 466 and between the client-facing tier 402 and the private network 410. The switch 430 may act as a transmitter to send the content and/or locator code data to the media device. The means for transmitting the locator code data to the media device may include the switch 430.

The CFT switch 430 may also be coupled to a terminal server 434 that provides terminal devices with a connection point to the private network 410. In a particular embodiment, the CFT switch 430 may also be coupled to a video-on-demand (VOD) server 436 that stores or provides VOD content imported by the IPTV system 400.

As illustrated in FIG. 4, the application tier 404 may communicate with both the private network 410 and the public network 412. The application tier 404 may include a first application tier (APP) switch 438 and a second APP switch 440. In a particular embodiment, the first APP switch 438 may be coupled to the second APP switch 440. The first APP switch 438 may be coupled to an application server 442 and to an OSS/BSS gateway 444. In a particular embodiment, the application server 442 may provide applications to the set-top box devices 416, 124 via the private access network 466, which enable the set-top box devices 416, 124 to provide functions, such as display, messaging, processing of IPTV data and VOD material, etc. In a particular embodiment, the OSS/BSS gateway 444 includes operation systems and support (OSS) data, as well as billing systems and support (BSS) data. In one embodiment, the OSS/BSS gateway 444 may provide or restrict access to an OSS/BSS server 464 that stores operations and billing systems data. The BSS may contain or access the watched program log information, for usage billing purposes, for example.

Further, the second APP switch **440** may be coupled to a domain controller **446** that provides web access, for example, to users via the public network **412**. For example, the domain controller **446** may provide remote web access to IPTV account information via the public network **412**, which users may access using their personal computers **468**. The second APP switch **440** may be coupled to a subscriber and system store **448** that includes account information, such as account information that is associated with users who access the system **400** via the private network **410** or the public network **412**. In a particular embodiment, the application tier **404** may also include a client gateway **450** that communicates data directly with the client-facing tier **402**. In this embodiment, the client gateway **450** may be coupled directly to the CFT switch **430**. The client gateway **450** may provide user access to the private network **410** and the tiers coupled thereto.

In a particular embodiment, the set-top box devices **416**, **124** may access the IPTV system **400** via the private access network **466**, using information received from the client gateway **450**. In this embodiment, the private access network **466** may provide security for the private network **410**. User devices may access the client gateway **450** via the private access network **466**, and the client gateway **450** may allow such devices to access the private network **410** once the devices are authenticated or verified. Similarly, the client gateway **450** may prevent unauthorized devices, such as hacker computers or stolen set-top box devices from accessing the private network **410**, by denying access to these devices beyond the private access network **466**.

For example, when the first representative set-top box device **416** accesses the system **400** via the private access network **466**, the client gateway **450** may verify subscriber information by communicating with the subscriber and system store **448** via the private network **410**, the first APP switch **438**, and the second APP switch **440**. Further, the client gateway **450** may verify billing information and status by communicating with the OSS/BSS gateway **444** via the private network **410** and the first APP switch **438**. In one embodiment, the OSS/BSS gateway **444** may transmit a query across the first APP switch **438**, to the second APP switch **440**, and the second APP switch **440** may communicate the query across the public network **412** to the OSS/BSS server **464**. After the client gateway **450** confirms subscriber and/or billing information, the client gateway **450** may allow the set-top box device **416** access to IPTV content and VOD content. If the client gateway **450** cannot verify subscriber information for the set-top box device **416**, e.g., because it is connected to an unauthorized twisted pair, the client gateway **450** may block transmissions to and from the set-top box device **416** beyond the private access network **466**.

As indicated in FIG. 4, the acquisition tier **406** includes an acquisition tier (AQT) switch **452** that communicates with the private network **410**. The AQT switch **452** may also communicate with the operations and management tier **408** via the public network **412**. In a particular embodiment, the AQT switch **452** may be coupled to a live acquisition server **454** that receives television or movie content, for example, from a broadcast service **456**. In a particular embodiment during operation of the IPTV system, the live acquisition server **454** may acquire television or movie content. The live acquisition server **454** may transmit the television or movie content to the AQT switch **452**, and the AQT switch **452** may transmit the television or movie content to the CFT switch **430** via the private network **410**.

Further, the television or movie content may be transmitted to the video content servers **480**, where it may be encoded, formatted, stored, or otherwise manipulated and prepared for

communication to the set-top box devices **416**, **124**. The CFT switch **430** may communicate the television or movie content (and the locator code data) to the modems **414**, **122** via the private access network **466**. The set-top box devices **416**, **124** may receive the television or movie content via the modems **414**, **122**, and may transmit the television or movie content to the display devices **418**, **126**. In an illustrative embodiment, video or audio portions of the television or movie content may be streamed to the set-top box devices **416**, **124**.

In an example, non-limiting embodiment, each set-top box device **416**, **124** may receive content data **484**, which may include video content and/or audio content or portions thereof, from the client-facing tier **402** via the private access network **466**. The content data **484** may be associated with at least one program, such as a broadcast program itself. Multiple programs may be broadcast through the content data **484** at any given time, each with their own program content data.

Further, the AQT switch may be coupled to a video-on-demand importer server **458** that stores television or movie content received at the acquisition tier **406** and communicates the stored content to the VOD server **436** at the client-facing tier **402** via the private network **410**. Additionally, at the acquisition tier **406**, the video-on-demand (VOD) importer server **458** may receive content from one or more VOD sources outside the IPTV system **400**, such as movie studios and programmers of non-live content. The VOD importer server **458** may transmit the VOD content to the AQT switch **452**, and the AQT switch **452**, in turn, may communicate the material to the CFT switch **430** via the private network **410**. The VOD content may be stored at one or more servers, such as the VOD server **436**.

When users issue requests for VOD content via the set-top box devices **416**, **124**, the requests may be transmitted over the private access network **466** to the VOD server **436**, via the CFT switch **430**. Upon receiving such requests, the VOD server **436** may retrieve the requested VOD content and transmit the content to the set-top box devices **416**, **124** across the private access network **466**, via the CFT switch **430**. The set-top box devices **416**, **124** may transmit the VOD content to the display devices **418**, **126**. In an illustrative embodiment, video or audio portions of VOD content may be streamed to the set-top box devices **416**, **124**.

FIG. 4 further illustrates that the operations and management tier **408** may include an operations and management tier (OMT) switch **460** that conducts communication between the operations and management tier **408** and the public network **412**. In the embodiment illustrated by FIG. 4, the OMT switch **460** is coupled to a TV2 server **462**. Additionally, the OMT switch **460** may be coupled to an OSS/BSS server **464** and to a simple network management protocol (SNMP) monitor server **478** that monitors network devices within or coupled to the IPTV system **400**. In a particular embodiment, the OMT switch **460** may communicate with the AQT switch **452** via the public network **412**. In an illustrative embodiment, the live acquisition server **454** may transmit the television or movie content to the AQT switch **452**, and the AQT switch **452**, in turn, may transmit the television or movie content to the OMT switch **460** via the public network **412**. In this embodiment, the OMT switch **460** may transmit the television or movie content to the TV2 server **462** for display to users accessing the user interface at the TV2 server **462**. For example, a user may access the TV2 server **462** using the personal computer (PC) **468** coupled to the public network **412**.

Computer Architecture

FIG. 5 shows a diagrammatic representation of a machine in the example form of a computer system **500** within which

a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed. In alternative embodiments, the machine operates as a standalone device or may be connected (e.g., networked) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client machine in server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine may be a digital video recorder (DVR), a personal computer (PC), a tablet PC, a set-top box (STB), a Personal Digital Assistant (PDA), a cellular telephone, a web appliance, a network router, switch or bridge, or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. Further, while only a single machine is illustrated, the term “machine” shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

The example computer system **500** includes a processor **502** (e.g., a central processing unit (CPU), a graphics processing unit (GPU) or both), a main memory **504** and a static memory **506**, which communicate with each other via a bus **508**. The main memory **504** and/or the static memory **506** may be used to store the recorded programs, and other data or information discussed herein. In an additional embodiment, the data may be stored in volatile memory.

The computer system **500** may further include a video display unit **510** (e.g., a television, a liquid crystal display (LCD) or a cathode ray tube (CRT)) on which to display broadcast or other programs, for example. The computer system **500** also includes an alphanumeric input device **512** (e.g., a keyboard or a remote control), a user interface (UI) navigation device **514** (e.g., a remote control, or a mouse), a disk drive unit **516**, a signal generation device **518** (e.g., a speaker) and a network interface device **520**.

The input device **512** and/or the navigation device **514** (e.g., the remote control) may include a processor (not shown), and a memory (not shown).

The disk drive unit **516** includes a machine-readable medium **522** on which is stored one or more sets of instructions and data structures (e.g., software **524**) embodying or utilized by any one or more of the methodologies or functions described herein. The software **524** may also reside, completely or at least partially, within the main memory **504** and/or within the processor **502** during execution thereof by the computer system **500**, the main memory **504** and the processor **502** also constituting machine-readable media.

The software **524** and/or the data stream **184**, **484** from the content provider may further be transmitted or received over a network **526** (e.g., a television cable provider) via the network interface device **520** utilizing any one of a number of well-known transfer protocols (e.g., broadcast transmissions, HTTP).

While the machine-readable medium **522** is shown in an example embodiment to be a single medium, the term “machine-readable medium” should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term “machine-readable medium” shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the present invention, or that is capable of storing, encoding or carrying data structures utilized by or associated with such a set of instructions. The term “machine-readable medium”

shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic media, and carrier wave signals.

Therefore, methods and systems to customize an interface based on viewed programming have been described. Although an embodiment of the present invention has been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

The invention claimed is:

1. A system comprising:

- a video content server;
- a watched program log to store a plurality of locally viewed programs viewed through a media device, wherein each of the locally viewed programs is supplied by the video content server;
- a data extractor to search through a network of servers independent of the video content server for content information related to each of the locally viewed programs, and to extract data associated with the content information related to each of the locally viewed programs;
- a database to store the data associated with the content information related to each of the locally viewed programs, wherein the data associated with the content information is stored in the database so long as each of the locally viewed programs have been viewed for at least a predetermined duration;
- a custom interface generator, wherein an interface generated by the custom interface generator is accessible over a distributed data network, wherein the interface is customized according to the data associated with the content information related to each of the locally viewed programs; and
- wherein the interface displays a locally viewed program from the watched program log and the data associated with the content information related to the locally viewed program that has been viewed for at least the predetermined duration.

2. The system of claim **1** wherein the interface is displayed through the media device as a prompt feature to access the content information related to the locally viewed program, wherein the prompt feature is selected from a group including a toolbar, a sidebar and a menu page.

3. The system of claim **1** wherein the data is selected from a group comprising a web link to the content information related to the locally viewed program, a cooking recipe, a discussion group, a web log, a transcript, a program rating system, a promotional product link, an actor non-streamed webcast link, information of a related program, other episodes of the locally viewed program, a program summary, and a video thumbnail.

4. The system of claim **1** wherein the interface does not include information for a recorded program when the recorded program has not been played.

5. The system of claim **1** wherein the interface is displayed through a mobile device.

6. A method comprising:

- storing, on a video content server, a program presented at a media device;
- searching through a network of servers independent of the video content server for content information related to the program presented at the media device;

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extracting data associated with the content information related to the presented program;
storing the data associated with the content information related to the presented program; and

generating an interface customized in response to the data associated with the content information related to the presented program that has been viewed for at least a duration.

7. The method of claim 6, comprising displaying the interface through the media device as a prompt feature to access the content information related to the presented program, wherein the prompt feature is selected from a group including a toolbar, a sidebar and a menu page.

8. The method of claim 6, comprising displaying the interface through a mobile device.

9. The method of claim 6 wherein extracting further includes representing the data as being selected from a group including a web link to the related content information, a cooking recipe, a discussion group, a web log, a transcript, a program rating system, a promotional product link, an actor non-streamed webcast link, information of a related program, other episodes of the viewed program, a program summary, and a video thumbnail.

10. The method of claim 6 comprising ensuring that the interface excludes content information for a program that has been recorded and that has not been viewed.

11. The method of claim 6 comprising ensuring that the information related to the presented program is nearly immediately available after the corresponding program is viewed.

12. The method of claim 11 comprising ensuring that the presented program is viewed at least the duration before the information related to a particular viewed program is added to the interface.

13. A web interface comprising:

a viewed content section comprising information related to locally viewed content viewed at a media device, the viewed content section is to be generated by a system with a video content server that stores information regarding the locally viewed content viewed at the media device, and is to search through a network of servers independent of the video content server for information related to the locally viewed content in response to the stored information, and is to extract the data from the information related to the locally viewed content for locally viewed programs that have been viewed for a predetermined duration at the media device.

14. The interface of claim 13 wherein the data is selected from a group including a web link to the information related to the locally viewed content, a cooking recipe, a discussion group, a web log, a transcript, a program rating system, a promotional product link, an actor non-streamed webcast link, information of a related program, other episodes of the locally viewed content, a program summary, and a video thumbnail.

15. The interface of claim 13, wherein the web interface does not include a section for content recorded by the media device and which is not viewed through the media device.

16. The interface of claim 13, wherein the web interface is personalized to a user of the media device and personalized in response to an attribute selected from a group including age, language, demographics, geographic region, profile, and personal interface preferences.

17. The interface of claim 13, further comprising a plurality of viewed content sections arranged such that a particular program is displayed more prominently than another program on the web interface.

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18. The interface of claim 13, wherein the viewed content section is nearly immediately available after an associated program is viewed.

19. The interface of claim 18, wherein the associated program is to be viewed a minimum amount of time before the viewed content section is presented on the web interface.

20. The interface of claim 18, wherein the viewed content section includes a prompt feature to access the information related to the locally viewed content viewed at the media device, wherein the prompt feature is selected from a group including a toolbar, a sidebar and a menu page.

21. A system comprising:

a database to locally record a program from a service provider;

a processor of a video content server to process information when the program is viewed at a media device; and

a transmitter to transmit the viewed program information to be used to extract data from a network of servers independent of the video content server, the data related to the program viewed, the data used to generate a customized interface based on information related to locally viewed content that has been viewed for a predetermined duration at the media device.

22. The system of claim 21 wherein the data is selected from a group including a web link to the information related to locally viewed content, a cooking recipe, a discussion group, a web log, a transcript, a program rating system, a promotional product link, an actor non-streamed webcast link, information of a related program, other episodes of the viewed program, a program summary, and a video thumbnail.

23. The system of claim 21 wherein the program is viewed a minimum amount of time before the transmitter transmits the information related to the locally viewed content.

24. A system comprising:

a video content server having a custom interface generator, wherein an interface generated by the video content server is accessible over a distributed data network, wherein a network of servers independent of the video content server is searched for information related to a locally viewed program viewed at a media device, wherein data associated with the information is extracted, wherein the interface is customized based on the locally viewed programs viewed for a predetermined duration on the media device and in response to the extracted data.

25. The system of claim 24 wherein the interface is displayed at the media device as a prompt feature to access the information related to the locally viewed program, wherein the prompt feature is selected from a group including a toolbar, a sidebar and a menu page.

26. The system of claim 24 wherein the data is selected from a group including a web link to the information related to the locally viewed program, a cooking recipe, a discussion group, a web log, a transcript, a program rating system, a promotional product link, an actor non-streamed webcast link, information of a related program, other episodes of the locally viewed program, a program summary, and a video thumbnail.

27. The system of claim 24 wherein the interface excludes information for a program that has been recorded when that program has not been viewed.

28. The system of claim 24 wherein the interface is displayed through a mobile device.

29. The system of claim 24 wherein the program is viewed a minimum amount of time before related content is added to the interface.